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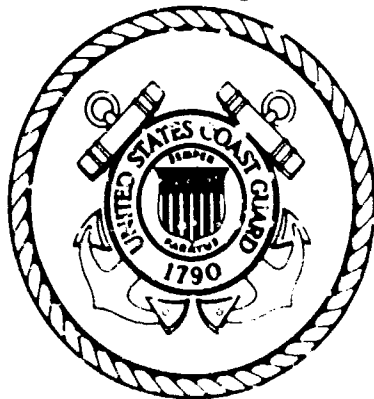
REPORT NO. 438

PROJECT 3981/01/20

SUPERIOR SIGNAL, 15 MINUTE, MODEL OS-15  
FLOATING ORANGE SMOKE SIGNAL

2 MAY 1966

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Washington, D.C.

20226



UNITED STATES COAST GUARD  
FIELD TESTING AND DEVELOPMENT CENTER

TEST REPORT

PROJECT 3981/01/20

SUPERIOR SIGNAL, 15 MINUTE, MODEL OS-15,  
FLOATING ORANGE SMOKE SIGNAL

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#### ABSTRACT

This report covers preapproval testing of eight Prototype Model OS-15 (15-minute) Floating Orange Smoke Distress Signals manufactured Superior Signal Company, Inc., Spotswood, New Jersey. Signals were dated 12-65. The tests carried out are those required by 46 CFR 160.057 of 8 September 1965.

The sample lot of distress smoke signals failed to meet the requirements of Coast Guard Specification 160.057 in both operational and technical tests.

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1. INTRODUCTION:

The purpose of these tests was to determine if certain floating orange smoke distress signals meet applicable Coast Guard specifications. A complete description of the smoke signals tested is included in Appendix A with the test results.

2. MATERIAL TESTED:

The material tested was Superior Model OS-15 floating orange smoke distress signals. The signals were encased in metal containers painted gray with the directions for use typed on paper and taped to the containers. Manufacture was intended to meet the requirements of 46 CFR 160.057 dated 8 September 1965. These prototype signals were manufactured by Superior Signal Company, Inc., Spotswood, New Jersey.

3. TESTS CONDUCTED:

Eight (8) distress signals were tested in accordance with U. S. Coast Guard Specification for Signals, Distress, Floating Orange Smoke (15 minutes) for Merchant Vessels, Subpart 160.057, Subparagraph 4(b). The following tests were conducted:

<u>TEST</u>	<u>APPLICABLE PARAGRAPH OF SPECIFICATION</u>
<u>OPERATIONAL TESTS:</u>	
Ignition and smoke emitting characteristics, and smoke emitting time.	160.057-4(e) and (f)
Underwater smoke emission.	160.057-4(g)
<u>TECHNICAL TESTS:</u>	
Elevated temperature, humidity and storage.	160.057-4(h)
Susceptibility to explosion and corrosion-resistance.	160.057-4(i) and (j)
Color of smoke.	160.057-4(k)
Volume and density.	160.057-4(l)

#### 4. TEST RESULTS:

The results of all tests are included in Appendix A. These test results are listed and described using the corresponding paragraph description in the applicable Coast Guard Specification. A detailed description of the test procedure in each case is contained in the specification. Specimens were numbered 1 through 8 for identification.

#### 5. DISCUSSION OF RESULTS:

Three of the eight signals tested failed to meet the requirements of the Coast Guard Specification in operational tests and one in technical tests.

##### a. Operational Tests:

Sub-paragraph 160.057-4(b)(1)(i) of the specification requires that all operational test specimens be subjected to water-resistance conditioning. This conditioning consists of immersing the specimen horizontally with uppermost portion of the signal approximately one-inch below the surface of the water for a period of 24 hours. Signals are required to function properly after this conditioning.

Following this conditioning, specimens 1, 2 and 3 failed to ignite properly. The igniter mechanism ignited the fuse; however, it failed to ignite the smoke producing composition. Examination revealed that water had entered the signals via the cap during the water-resistance conditioning period and soaked the smoke producing composition. (See Figures 1 through 3.)

When the prescribed percentage of failure was assigned to those signals not fully meeting the specifications, and then averaged for the full number tested in operational tests, the resulting average percentage of failure was 75%. This is more than the allowable maximum of 15%; hence, the sample lot is considered to have failed all operational tests.

##### b. Technical Tests:

This sample lot failed to meet all requirements of the technical tests. Specimen No. 7 failed to meet the volume and density requirement for the full 12 minutes required. Specifically, this signal provided less than the specified 70% transmission for only 11 minutes.

Sub-paragraph 160.057-4(t)(2)(ii) of the specification states that no deviation from the requirements of the technical tests are permitted. Therefore, the sample lot is considered to have failed the technical tests.



6. CONCLUSIONS:

The Model OS-15, 15-minute, Floating Orange Smoke Distress Signals, dated 12-65, manufactured by the Superior Signal Company, Inc., Spotswood, New Jersey, failed to meet the appropriate Coast Guard Specifications in operational and technical tests.

APPENDIX A  
TEST DATA SHEETS

TEST DATA SHEET I

1. MATERIAL TESTED:

The material tested was Superior Model OS-15, (15-minute), Floating Orange Smoke Distress Signals manufactured by the Superior Signal Company, Inc., Spotswood, New Jersey. Specimens tested were dated 12-65.

2. TESTS CONDUCTED AND RESULTS:

a. 160.057-4(b)(1) - Operational Tests:

(1) Ignition and smoke emitting characteristics, and smoke emitting time.

SPECIMEN NUMBER	BURNING TIME		IGNITION AND SMOKE EMITTING CHARACTERISTICS	KIND OF DEFECT	PERCENT OF FAILURE
	M.	S.			
1				Failure to ignite	100%
2				Failure to ignite	100%
3				Failure to ignite	100%

(2) Underwater smoke emission:

4	5	40	GOOD	None	None
---	---	----	------	------	------

(3) Table 160.057-4(b)(1)(ii) - Average percentage of failure - 75%.

b. 160.057-4(b)(2) - Technical Tests:

(1) Elevated temperature, humidity and storage (operation after conditioning).

5	16	10	Good	None	-
---	----	----	------	------	---

(2) Susceptibility to explosion and corrosion resistance.

Specimen No. 6 - Satisfactory.

(3) Volume and density:

Specimen No. 7 - Specimen provided the required volume of smoke for 11 minutes (12 minutes required by the specification).

(4) Color of smoke:

Specimen No. 8 - Satisfactory.

c. Paragraph 160.057-4(b)(2)(ii) - No deviations from the requirements are permitted for technical tests.

APPENDIX B

Photographs

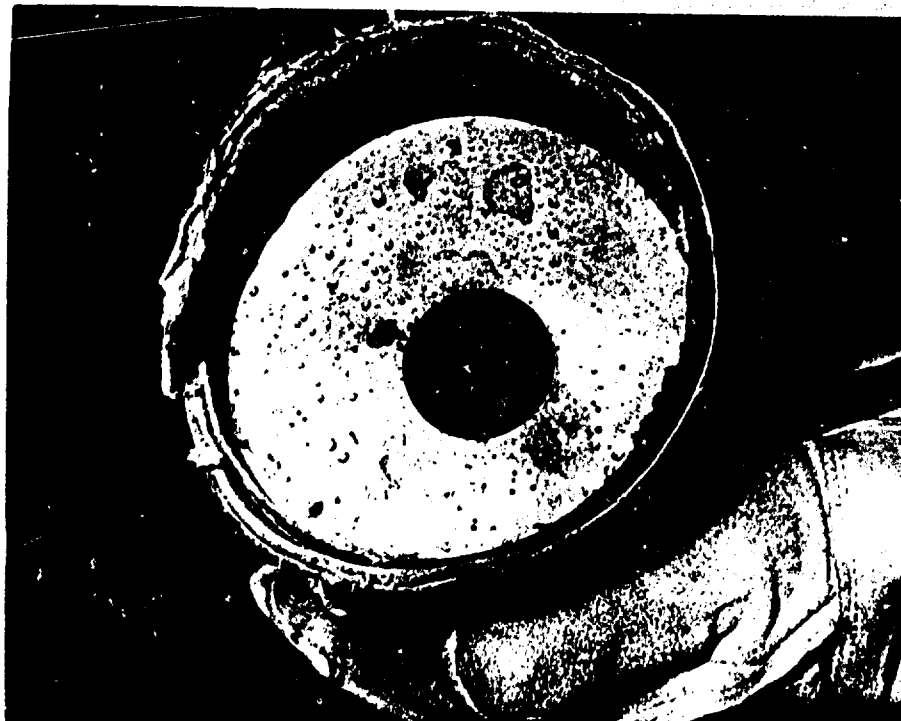


FIGURE 1 - Specimen No. 1 - Note water inside signal.



FIGURE 2 - Specimen No. 2 - Smoke making composition  
water soaked.



FIGURE 3 - Specimen No. 3 - Smoke making composition  
water soaked.